

IEEE INTERNATIONAL CONFERENCE AUTOMATICS AND INFORMATICS'2020 (ICAI'20), 1-3 October 2020 (ONLINE)

<http://icai-conf.org>

CONFERENCE PROGRAM

**THE GIVEN TIME IS ACCORDING TO THE BULGARIAN TIME ZONE –
SOFIA (UTC+3 HOURS)**

Thursday, October 1th

10.20 - 10.30 WELCOME AND OPENING CEREMONY

Stream 1

10.30 - 11:40 PLENARY SESSION (PS)

Stream 1

1.The Necessity of Higher Engineering Education Transformation in Bulgaria in the Artificial Intelligence Era

Mincho Hadjiski

2.Integration of Image Recognition in Information Systems

Georgi Kadrev

11.40 - 12:00 DISCUSSION IN THE PLENARY SESSION

13:00 - 14.00 Lunch time

14.00 - 18.00 SCIENTIFIC SESSIONS

Stream 1	Stream 2
14.00 - 16.00 SESSION A11 “CONTROL THEORY 1” Chairman: Petko Petkov	14.00 - 16.00 SESSION A21 “COMPUTER TECHNOLOGIES 1” Chairman: Rumen Trifonov
1.Performance analysis and robust analysis of the DRC-system of robot-manipulator FANUC M-430IA/4FH Emil Nikolov and Nina Nikolova 2.Gramians computation for parabolic distributed parameter systems	1.Approaches for efficient data extraction from data cube structure Antoaneta Ivanova 2.Unified database for ship monitoring and diagnostic system

<p>Kamen Perev</p> <p>3. Identification and synthesis of PI controller for electrohydraulic servo system Stanimir Yordanov, Krasimir Ormandzhiev, Georgi Mihalev and Krasen Kostov</p> <p>4. Explicit Nonlinear Model Predictive Control of a Two-Chamber Microbial Fuel Cell Chong Li, Alexandra Grancharova and Liping Fan</p> <p>5. Design of Temperature Control System using Quantitative Feedback Theory Desislava Stoitseva-Delicheva and Vesela Karlova-Sergieva</p>	<p>Georgi Enchev, Nikolay Djagarov, Zhivko Grozdev and Stepan Dmitriev</p> <p>3. Software Quality Metrics – Research, Analysis and Recommendation Tsvetelina Mladenova</p> <p>4. SPaS: a software package for scaffolding generation Daniel Damyanov, Zlatko Varbanov and Silviya Varbanova</p> <p>5. Approbation of software agent Evaluator in a nonspecific environment for extension of its purpose Georgi Cholakov</p>
<p>16.00 - 18.00 SESSION A12 “CONTROL THEORY 2” Chairman: Kamen Perev</p>	<p>16.00 - 18.00 SESSION A22 “COMPUTER TECHNOLOGIES 2” Chairman: Hristo Valchanov</p>
<p>1. Analysis of the control accuracy in steady state of a hybrid PI controller Vesko Uzunov and Ivelina Zlateva</p> <p>2. Two Degree of Freedom Control of MIMO plant using PID and decoupling matrix Bozhidar Rakov and Georgi Ruzhekov</p> <p>3. Design of chaotic synchronization system combining projective, marginal and hybrid synchronization with application to image encryption Hristina Stoycheva and Dragomir Chantov</p> <p>4. Trainable mathematical model of gas exchange of a ship diesel engine as an element of a synergetic system Yulian Moskov</p> <p>5. An algorithm with reduced computational complexity for estimation of parameters of linear stationary discrete systems Nikola Nikolov and Mariela Alexandrova</p>	<p>1. Visual differential debugging in the domain-specific visual programming languages Martin Vassilev and Alexander Penev</p> <p>2. Algorithm A* and Design Patterns used in Unity Video Game development Dimitrichka Nikolaeva, Mertdzhan Safi, Martin Mihailov, Alexander Georgiev, Violeta Bozhikova and Mariana Stoeva</p> <p>3. Supervisory and Data Acquisition project with LoRa Stoicho Penkov, Albena Taneva and Robert Kazala</p> <p>4. Analysis of ZigBee Network Using Simulations and Experiments Aydan Haka, Veneta Aleksieva, Hristo Valchanov and Diyan Dinev</p> <p>5. Evaluating IoT Reference Architecture Luben Boyanov, Valentin Kisimov and Yavor Christov</p> <p>6. Designing a Communication Tier for the IoT Platform EMULSION Ivan Ganchev, Zhanlin Ji and Máirtín O’droma</p>

Friday, October 2th

9.00 - 13.00 SCIENTIFIC SESSIONS

Stream 1	Stream 2
<p>9.00 - 11.00 SESSION B11 “PROCESS CONTROL” Chairman: Kosta Boshnakov</p>	<p>9.00 - 11.00 SESSION B21 “COMPUTATIONAL INTELLIGENCE” Chairman: Snejana Yordanova</p>
<p>1. Advanced Process Control of Distributed Parameter Plants by Integration First Principle Modeling and Case-Based Reasoning. Part 1: Framework of DPP Control with Initial Uncertainty Mincho Hadjiski and Nencho Deliiski</p> <p>2. Advanced Process Control of Distributed Parameter Plants by Integration First Principle Modeling and Case-Based Reasoning. Part 2: Case-Based Reasoning Control of DPP Mincho Hadjiski and Nencho Deliiski</p> <p>3. Dynamic Control for Convective Apricots Dryer Donka Ivanova, Nikolay Valov and Irena Valova</p> <p>4. Tilt and Rotation Motion Control Systems for Solar Panel Kane Hening, Saad Sohail, William Kerbel, Russell Trafford, Nidhal Bouaynaya, Robi Polikar and Petia Georgieva</p> <p>5. Integrated approach to control the beer production process: lautering and boiling Vesela Shopska and Georgi Kostov</p>	<p>1. Pre-trained Deep Learning Models for Facial Emotions Recognition Atanas Atanassov and Dimitar Pilev</p> <p>2. Object size estimation with industrial robot gripper using neural network and machine learning Danail Slavov</p> <p>3. Load Balancing model based on Machine Learning and Segment Routing in SDN Dimitar Todorov, Hristo Valchanov and Veneta Aleksieva</p> <p>4. An update on case-based learning: the Gilboa-Schmeidler-Samuelson approach Rosen Lutskanov</p> <p>5. Modeling and Neural Control of 2-DOF Underwater Planar Manipulator Zhivko Zhekov, Nasko Atanasov and Ivan Grigorov</p>
<p>11.00 - 13.00 SESSION B12 “AUTOMATION” Chairman: Alexandra Grancharova</p>	<p>11.00 - 13.00 SESSION B22 “HEALTHCARE” Chairman: Tania Pencheva</p>
<p>1. Frame Modelling of Flexible Manufacture Module Selection and Expert Analysis of its Control System Javanshir Mammadov, Ramiz Huseynov, Khurban Abdullayev, Sabina Aliyeva and Ganima Huseynova</p>	<p>1. A Health-Route-Search Model Stanimir Stoyanov, Todorka Glushkova and Ivan Popchev</p> <p>2. Detection of Tremor Associated with Rest and Effort Activity Using Machine Learning</p>

<p>2.Control Device for a Type of Machine Tools Marin Zhilevski and Mikho Mikhov</p> <p>3.Application Of Inertia Moments For Improving The Quality Of Dimensional Control In Flexible Production Timur Aliyev, Arzu Ibrahimova and Gurban Mammadov</p> <p>4.An Intelligent Gene Bank Management System Asya Stoyanova-Doycheva, Emil Doychev, Stanimir Stoyanov and Asya Toskova</p> <p>5.Open-source ERP systems: an overview Tsvetelina Mladenova</p>	<p>Lilia Aljihmani, Oussama Kerdjij, Yibo Zhu, Ranjana Mehta and Khalid Qaraqe</p> <p>3.Information Graphers - COVID-19 MoniToR Rositsa Maksimova and Krassimir Kolev</p> <p>4.Linking data for ontology based advising in healthcare Maria Nisheva, Stoyan Hadzhiyski, Iliyan Mihaylov, Irena Avdjieva and Dimitar Vassilev</p> <p>5.Application of Machine Learning Methods for Determining the Stage of Cancerous Maya Todorova</p>
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13.00 - 14.00 Lunch time

14.00 - 18.00 SCIENTIFIC SESSIONS

Stream 1	Stream 2
<p>14.00 - 16.00 SESSION B13 “MATHEMATICAL STATISTIC” Chairman: Kiril Tenekedjiev</p>	<p>14.00 - 16.00 SESSION B23 “EDUCATION 1 ” Chairman: Georgi Todorov</p>
<p>1.Bootstrap Pearson Test for Difference in Discrete Distributions Natalia Nikolova, Martin Crees-Morris, Yulian Tsonev and Kiril Tenekedjiev</p> <p>2.Parameter extraction from technical datasheet documentation using technique optimized through genetic algorithm Angel Marinov</p> <p>3.Stochastic Random Walk Algorithm for Predicting Fatal Events in Multi-component Systems Stefan Filipov, Fani Tomova, Atanas Atanassov and Stefan Panov</p> <p>4.Application of Statistical Methods for Analysis of Laboratory Data Svetla Lekova and Juliana Javorova</p> <p>5.Traditional Bulgarian Costume Classification in a Tourist Guide application</p>	<p>1.Progressive challenge selection in the context of virtual education space Mihail Petrov and Vladimir Valkanov</p> <p>2.An Interpreter Implementation of STRIPS Plans Used in Knowledge-Managed Tutoring Systems Milko Marinov</p> <p>3.E-learning at a COVID-19 context - epidemiological and educational challenges Rosen Radkov, Desislava Vankova, Zhaneta Radkova and Yulka Petkova</p> <p>4.Using of interactive web-based electric drive design tools in e-learning in pandemic time Radoslav Hrishev and Nikola Shakev</p> <p>5.Educational Technologies based on Artificial Intelligence: some pros and cons Petar Iliev</p>

Stefan Staynov, Kristian Milev, Georgi Kostadinov and Asya Stoyanova	
16.00 - 18.00 SESSION B14 "ROBOTICS" Chairman: Andon Topalov	16.00 - 18.00 SESSION B24 "EDUCATION 2" Chairman: Valeri Mladenov
<p>1. Inverse Kinematics Neural Approximation and Neural Control of Two-link Planar Robot Zhivko Zhekov</p> <p>2. Comparative analysis of RoboDK and robot operating system for solving diagnostics tasks in off-line programming Atanas Garbev and Atanas Atanasov</p> <p>3. Mobile Robot Simulation and Navigation in ROS and Gazebo Denis Chikurtev</p> <p>4. Learning Self-Awareness: Lessons from Social Robotics Marina Bakalova and Radostina Minina</p> <p>5. Companion robotic assistants for improving the quality of life of people with disabilities Margarita Bakracheva and Nayden Chivarov</p>	<p>1. An Approach for Parallel Reading in Multiple Sequence Alignment Soon-Heum Ko and Veska Gancheva</p> <p>2. Experts' perspective for selecting learning analytics visualizations Dafinka Miteva and Eliza Stefanova</p> <p>3. Methodology for content preparation of online courses Ivaylo Blagoev, Gergana Vassileva and Vladimir Monov</p> <p>4. Design and implementation of CBIR system for academic/education purposes Miroslav Marinov, Irena Valova and Yordan Kalmukov</p> <p>5. Survey on the importance of using personal data for learning analytics and of data privacy Adelina Aleksieva-Petrova and Milen Petrov</p>
18.00 - 19.00 DISCUSSION Chairman: Mincho Hadjiski	
"Higher engineering education problems in era of artificial intelligence"	

Saturday, October 3th

9.00 - 13.00 SCIENTIFIC SESSIONS

Stream 1	Stream 2
9.00 - 11.00 SESSION C11 “TRANSPORTATION 1” Chairman: Gancho Vachkov	9.00 - 11.00 SESSION C21 “SECURITY AND MATHEMATICAL MODELING ” Chairman: Vladimir Jotsov
<p>1.Integrated management of transportation by bi-level optimization Krasimira Stoilova and Todor Stoilov</p> <p>2.Modeling and optimization of traffic flows in a network Elisaveta Trichkova-Kashamova</p> <p>3.Optimal Control of Traffic Lights in Urban Area Stanislav Dimitrov</p> <p>4.Decision making by bi-level model of portfolio optimization Todor Stoilov, Krasimira Stoilova and Miroslav Vladimirov</p>	<p>1.Information Security in the Design of Web-Based Software Systems Hristo Hristov, Stoyan Cheresharov, Svetoslav Chonkov and Kostadin Tsvetanov</p> <p>2.Possibilities for Improving the Quality of Cyber Security Education through Application of Artificial Intelligence Methods Roumen Trifonov, Ognian Nakov, Slavcho Manolov, Georgi Tsochev and Galya Pavlova</p> <p>3.Cyber security: Threats and Challenges Georgi Tsochev, Roumen Trifonov, Ognian Nakov, Slavcho Manolov and Galya Pavlova</p> <p>4.Trainable mathematical model of fuel supply of a ship diesel engine as an element of a synergetic system Yulian Moskov</p> <p>5.Towards a Cost-Efficient Gunner Controller for a Modular Battle Tank Simulator Stefan D. Stavrev and Dimitar Ginchev</p>
11.00 - 13.00 SESSION C12 “TRANSPORTATION 2” Chairman: Gancho Vachkov	11.00 - 13.00 SESSION C22 “IMAGE PROCESSING” Chairman: Idilia Batchkova
<p>1.Reducing the Number of Incidents in Converged IT Infrastructure Using Correlation Approach Georgi Kostadinov, Tatiana Atanasova and Plamen Petrov</p> <p>2.Microscopic simulation of on-street parking: quantitative evaluation. The case study of Sofia, Bulgaria</p>	<p>1.COVID-19 detection through X-Ray chest images Diego Hernandez, Rodrigo Pereira and Petia Georgevia</p> <p>2.Tracking The Development Of Six Wheat Varieties Using Infrared Imaging And Image Processing Algorithms</p>

<p>Yordanka Boneva</p> <p>3.Simulation Framework For Studying Quality of Service Traffic Prioritization Algorithms in Li-Fi Network Diyen Dinev, Veneta Aleksieva and Hristo Valchanov</p> <p>4.Modelling And Vibration Analysis Of High-Speed Railway Tracks Erol Uyar and Mücahid Candan</p>	<p>Radko Mihaylov, Asparuh Atanasov, Albena Ivanova, Angel Marinov and Svetlozar Zahariev</p> <p>3.Multi-Objective Optimization in Image Approximation Plamen Petrov, Georgi Kostadinov, Petar Zhivkov, Veneta Velichkova, Stoyan Ivanov and Todor Balabanov</p> <p>4.Overall robust optimization of biopolymer synthesis with linear electron accelerators Lilyana Koleva, Elena Koleva, Monica R. Nemptanu, Mirela Braşoveanu, Tsvetomira Tsonevska and Volodia Dzharov</p>
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14.00 – 18.00 SCIENTIFIC SESSIONS

Stream 1	Stream 2
<p>14.00 - 16.00 SESSION C13 “ELECTROMECHANICAL SYSTEM CONTROL 1” Chairman: Mihail Petrov</p>	<p>14.00 - 16.00 SESSION C23 “INFORMATICS IN SOCIETY PROBLEMS” Chairman: Margarita Todorova</p>
<p>1.Random forest algorithm in determining the viability of the implementation of synchronous rectification/operation in power electronic converters Angel Marinov, Firgan Feradov, Toncho Papanchev and Emilian Bekov</p> <p>2.Influence of the Sampling Period in the Identification of a Dual-Mass DC Electromechanical System Using Symlet Wavelets Mariyana Todorova and Reneta Parvanova</p> <p>3.Comparison in application of recursive estimation and control of the real DC motor parameters in adaptive pole placement control system and adaptive system with self-tuning regulator with minimum variance Ivan Grigorov, Nasko Atanasov and Zhivko Zhekov</p> <p>4.Mathematical models of brushless double feed induction machines Nikolay Djagarov</p>	<p>1.Smart Contracts based on Private and Public Blockchains for the Purpose of Insurance Services Veneta Aleksieva, Hristo Valchanov and Anton Hulyian</p> <p>2.Innovative Industrial Bodies and Technologies for Energy Efficiency, Better Production and Quality of Life Dimitar Karastoyanov, Nikolay Stoimenov, Stanislav Gyoshev, Rosen Petrov and Milena Biserova</p> <p>3.Current State of Open Science in Balkan Universities Silvester Hasani, Eliza Stefanova, Krassen Stefanov and Atanas Georgiev</p> <p>4.Comparison of the accuracy and the execution time of classification algorithms for Bulgarian literary works Neli Kalcheva, Milena Karova and Ivaylo Penev</p> <p>5.Algorithm for generating and visualizing routes of an intelligent tourist guide</p>

<p>5.Exploration of the Efficiency of Autotransformer Discrete Alternating Voltage Regulators Milena Ivanova, Emil Panov and Emil Barudov</p>	<p>Georgi Kostadinov, Kristian Milev, Stefan Staynov and Asya Stoyanova-Doycheva</p>
<p>16.00 - 18.00 SESSION C14 “SENSOR NETWORKS” Chairman: Hristo Valchanov</p>	<p>16.00 - 18.00 SESSION C24 “ELECTROMECHANICAL SYSTEM CONTROL 2” Chairman: Mariela Alexandrova</p>
<p>1.Energy Efficient Multi-hop Communication Model for Wireless Sensor Networks Zlatan Ganev</p> <p>2.Overview and comparison of some outdoor radio propagation models in Wireless Sensor Networks Zlatan Ganev</p> <p>3.Investigating signal transmission between sensor nodes located in indoor environment Zlatan Ganev</p> <p>4.Usage of Factor Analysis for the quality assesement of electricity Vania Rangelova</p> <p>5.Desing and Analysis of an Electromechanical Vibration Exciter System Erol Uyar, Mücahid Candan and Mehmet Zor</p>	<p>1.A New Grid Tied Transformerless Inverter Topology with Flying Inductor. Part 1: Analysis Yovko Rakanov, Andrey Mirev and Juliana Javorova</p> <p>2.A New Grid Tied Transformerless Inverter Topology with Flying Inductor. Part 2: Simulations models Yovko Rakanov, Andrey Mirev and Juliana Javorova</p>

18:00 CLOSING CEREMONY